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September 15, 2004

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Mr. Dion Novak
Remedial Project Manager (SR-6J)
U.S. Environmental Protection Agency
Region 5
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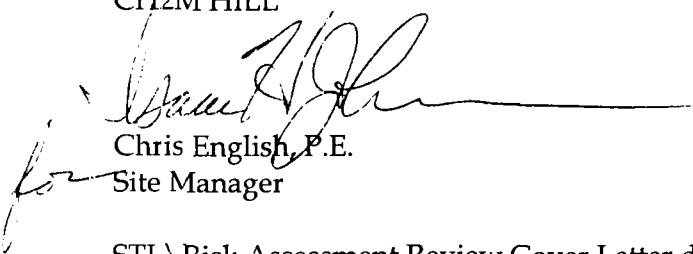
Subject: Revised Comments on Revised Human Health and Screening Level Ecological
Risk Assessment Reports, August 2004
Eagle Zinc Company Site, Hillsboro, Illinois
WA No. 219-RSBD-B5Y7, Contract No. 68-W6-0025

Dear Dion:

Please find enclosed a technical memorandum providing our revised comments on the Human Health and Screening Level Ecological Risk Assessment Reports that were submitted on August 19, 2004. These comments have been updated to address USEPA's specific questions and concerns on the reports. Please feel free to call us if you have any questions regarding the enclosed document.

Sincerely,

CH2M HILL


Chris English, P.E.
Site Manager

STL\Risk Assessment Review Cover Letter.doc

c: Stephen Nathan, PO/U.S.EPA, Region 5 (w/o enclosure)
Marshall McReynolds, CO/U.S. EPA, Region 5 (w/o enclosure) c/o Dave Alberts, CS
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Review of the Revised Human Health and Screening Level Ecological Risk Assessment Reports for the Eagle Zinc Company Site

TO: Dion Novak/USEPA Region 5

FROM: John Lowe/CH2M HILL
Ryan Loveridge/CH2M HILL
Chris English/CH2M HILL
Lisa Cundiff/CH2M HILL

DATE: September 15, 2004

CH2M HILL has reviewed the revised Human Health Risk Assessment (HHRA) and Screening Level Ecological Risk Assessment (SLERA) Reports for the Eagle Zinc Company Site (the Site) in Hillsboro, Illinois. The revised HHRA and SLERA Reports were submitted by ENVIRON on August 19, 2004. Our technical comments on each document are provided below.

Background

The original Human Health and Screening Level Ecological Risk Assessment Reports were submitted to USEPA in March 2004. CH2M HILL's comments on the documents were submitted to USEPA in a technical memorandum on April 5. Following USEPA's review of the documents, updated review comments were submitted to USEPA in a technical memorandum on April 23.

CH2M HILL participated in a meeting with the Potentially Responsible Party (PRP) Group and the USEPA Region 5 at ENVIRON's offices in Chicago, Illinois on June 2. Following the meeting, CH2M HILL prepared a technical memorandum summarizing an approach for evaluating on-site ecological receptors in the Eagle Zinc SLERA. CH2M HILL's human health and ecological risk assessors also discussed USEPA's review comments on the HHRA and SLERA in phone calls with the PRP Group's risk assessors. Teleconferences regarding the SLERA were held on June 7, 8, 9, and 14. A teleconference on the HHRA was held on June 29. The responses to comments on the HHRA and the SLERA were documented in letters from ENVIRON dated June 29 and July 15, respectively. CH2M HILL reviewed these letters and provided feedback to USEPA through email and phone correspondence. USEPA issued acceptance letters regarding the HHRA and SLERA responses to comments on July 29. The revised HHRA and SLERA reports were submitted on August 19. CH2M HILL's risk assessors reviewed the revised reports and have provided general and specific comments as presented in this Technical Memorandum.

Human Health Risk Assessment Report

General Comments

CH2M HILL's review of the revised Human Health Risk Assessment (HHRA) indicates that the respondents have incorporated most of the revisions requested by USEPA. However, there are some remaining issues in the HHRA that should be addressed so that the revised document is fully responsive to USEPA's comments. These remaining issues are listed below:

Assessment of potential off-site impacts and off-site exposure pathways from windblown dust. At the June 2, 2004 meeting, the PRP Group reminded USEPA of existing soil sampling data collected by the Illinois Environmental Protection Agency (IEPA), which, according to the PRP Group, demonstrate that off-Site soil has been shown to have no impacts attributable to releases from the Site. However, the revised HHRA, and the preceding Phase I Technical Memorandum, have failed to make a demonstration that these data are adequate for concluding that off-site metals impacts in soil are absent from windblown dust from the site. For example, neither document has provided the following:

- 1) a windrose diagram verifying the prevailing wind direction;
- 2) evaluation of the adequacy of IEPA's soil sampling design for an off-site air pathway analysis.

It is anticipated that further evaluation of potential off-site exposure pathways based on these data will be provided in the Remedial Investigation (RI) Report. However, for purposes of the HHRA, potential exposure pathways to off-site soils cannot be judged to be incomplete. At this time, calculation of risks associated with off-site exposure pathways is not being requested in the HHRA. Minor revisions will be required for the text and tables of the HHRA to document that site risks may be understated because risks from potentially complete off-site exposure pathways have not been quantified.

An air pathway analysis of the off-site exposure pathways through wind-blown dust may be warranted following the RI or the Feasibility Study (FS). Following this air pathway analysis, potential risks associated with off-site exposure pathways can be addressed in a supplement to the RI or FS report.

Calculation of on-site exposure point concentrations in soil based on site-wide average concentrations. At the June 2, 2004 meeting, the PRP Group responded to USEPA's request to estimate on-site risks based on maximum concentrations in soil by stating that representative concentrations of COPCs in on-site soil were calculated using all soil samples collected on site. The assumption underlying this approach is that on-site receptors could randomly move over the entire 132 acre site, throughout their exposure frequency and duration period. In the revised HHRA (page 10, second full paragraph), it is stated, "[b]ecause these areas do not represent actual or anticipated human activity patterns, receptor presence is considered equally likely in all areas, and sample locations were biased to locations exhibiting elevated XRF field screening levels, all available soil data were combined to calculate representative concentrations of soil COPCs for use in the HHRA."

The revised language should be reworded as shown in the strikeouts and italics, in order to address potential uncertainties in estimated risks associated with activity patterns that might not conform to the assumptions used in the HHRA: *"Because these These areas do not currently represent actual or anticipated human activity patterns, For purposes of this HHRA, it is assumed that a receptor would uniformly contact affected media across the entire site. Therefore, it is assumed that the representative concentration a receptor could be exposed to is the upper confidence limit on the average across the entire site. However, if an individual's activities were confined to a more limited portion of the site, potential exposures and risks could be different than projected in this HHRA; the potential risks could be either higher or lower than projected in this HHRA, depending on the individual's location and concentrations in soil at that location. presence is considered equally likely in all areas, and sample-Sample locations were biased to locations exhibiting elevated XRF field screening levels, all available soil data were combined to calculate representative concentrations of soil COPCs for use in the HHRA."*

Calculation of exposure point concentrations. The sampling and analytical data in soil and groundwater provided in Attachment C were reviewed to verify the exposure point concentrations. These data were analyzed using ProUCL to verify the 95% UCL concentrations used as exposure point concentrations in the HHRA. In several cases, ProUCL provided different values for 95% UCLs; in most cases, this appears to have occurred because the HHRA defaulted to a distribution-free UCL even in cases where that selection probably was not appropriate. Though the HHRA now cites the latest USEPA guidance for calculating exposure point concentrations, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, OSWER 9285.6-10, December 2002, it does not appear that the exposure point concentration calculations were developed in accordance with that guidance. While the exposure point concentration calculations used in the HHRA could not be verified using ProUCL, the revised exposure point concentrations calculated with ProUCL do not result in substantial changes to the estimated cancer risks or hazard quotients, and the numerical risk estimates still fall within the low end of the risk reduction range (10^{-6} to 10^{-4} excess lifetime cancer risk), as was presented in the HHRA.

Revision of the HHRA to address this discrepancy may not be warranted, given the insubstantial changes in estimated risks that would occur with the revision in exposure point concentrations.

Screening Level Risk Assessment Report

General Comments

CH2M HILL's review of the SLERA included a quality check of the calculations, and an evaluation of the assumptions and conclusions. Calculation errors were minor, and are listed in the Specific Comments section below. In general, this version of the risk assessment is much improved over the earlier versions. We do however, have a few remaining issues.

Because the hazard quotients calculated for the drainageways are considered very high, the habitat quality and level of biological impairment in these drainageways requires additional documentation in the SLERA. Hazard quotients based on acute (surface water), severe (sediment), and low effect (piscivores) ecological screening values were observed that

exceeded 10 at several locations in the Western Drainageway (before the confluence) and Eastern Drainageway (to the most downstream location). The habitat quality in these areas was described as poor in the SLERA, and therefore, ecological risks were considered negligible. Given that high-magnitude hazard quotients were observed, additional documentation regarding the habitat quality and biological impairment is required to support the conclusion that chemical impacts are negligible compared to the physical impacts. The suggestion is to identify or collect additional habitat quality/biological data from within these drainageways and update the risk conclusions.

It is also necessary to make clear in the SLERA that the results and conclusions are based on the current conditions. Changes in exposure, because of future development or extended periods of inactivity, and the risks associated with the exposure may change as the functional ecological habitat of the site is restored (including the habitats within the drainageways). Because high-magnitude hazard quotients were observed in the drainageways, an increase in the habitat quality would amplify the associated ecological risks.

Specific Comments

Page 51, Section 4.2.3. Surrogate receptors - the mink and the green heron - were selected for the piscivore endpoint in the SLERA, and risks were identified for these receptors. In the Step 3a (as summarized on this page), it was concluded that, because the mink is unlikely to access the pond in the Western Drainageway, risks to the mink are negligible. Risks would still be present for other mammalian piscivores that do not have this access limitation.

Table 2-1a. The ILH2O acute ESVs for nickel and zinc appear to be incorrectly calculated. Corrections of these values will result in hazard quotients below 1 in Table 4-3b, but is unlikely to change the risk conclusions.

Table 2-1b. The equation for acute dissolved Pb has been repeated twice.

Table 3-3a. The header for Most Sensitive Piscivore NOAEL-based ESV is missing a reference to (b) in the notes section.

Table 3-5b. The direct contact and piscivore water/diet HQs for the Western Background appear to be incorrect. Correction of these values is unlikely to change the risk conclusions.

Table 4-3c. The SLERA and acute ESVs are flipped on page 2 of 2 of the table (the calculations on this page are correct, however, using the ESVs from page 1 of 2).

Table 4-4b. NOAA PELs are different between pages 1 and 2 of the table. NOAA PELs on page 2 are incorrect. Hazard quotient calculations are correct, however.

Appendix D Tables. The ingestion rates for the terrestrial receptors are described as based on allometric equations but the values given were derived from the Wildlife Exposure Handbook (EPA, 1993).

Table D-2c. Mammal ingestion lists invertebrate and plant ingestion variables.